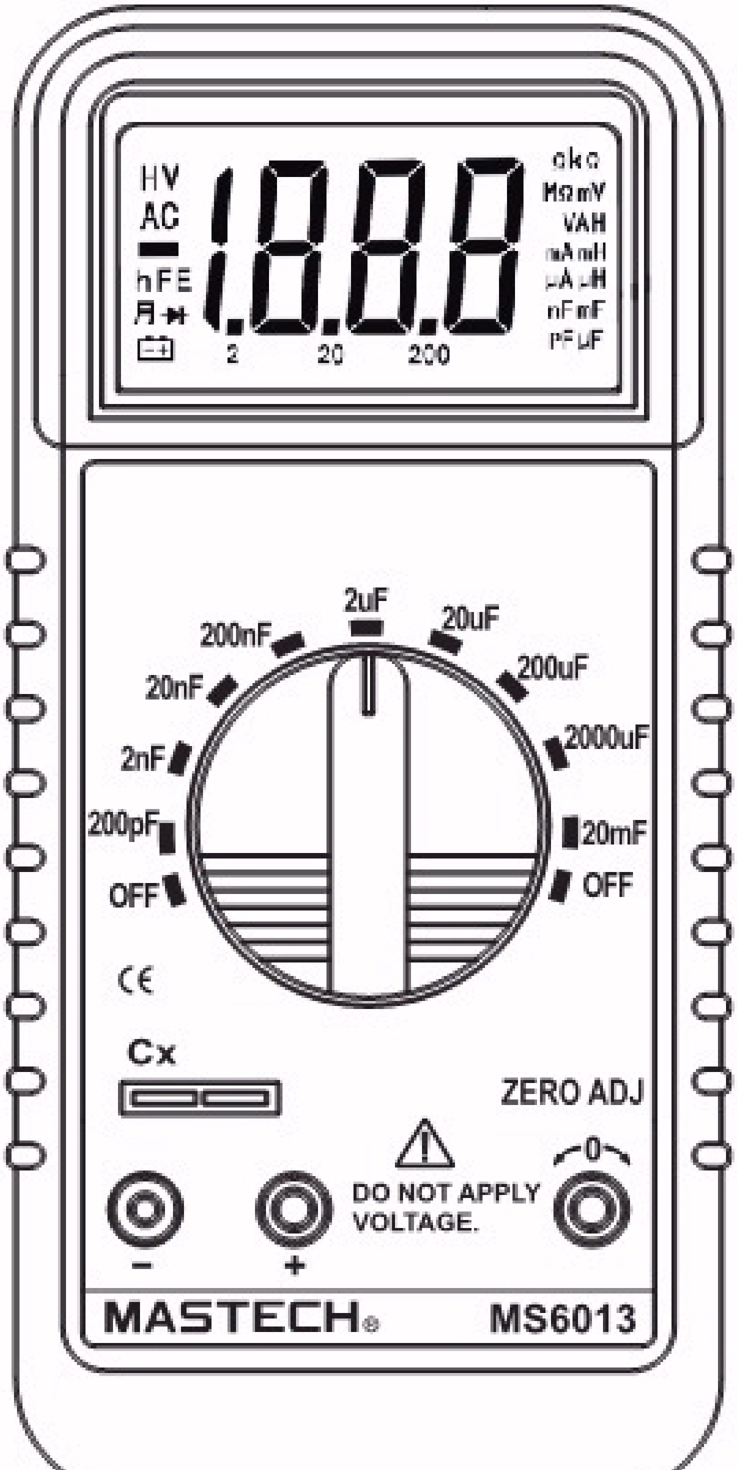
MASTECH® MS6013

PORTABLE
DIGITAL CAPACITANCE METER



1. GENERAL

1.1 Introduction

This Digital Capacitance Meter gives a direct reading of capacitance on a 3 1/2 digits LCD display. Nine ranges give precision readings from 0.1pF to 20mF, which includes virtually all capacitors used in electronic engineering laboratory, production,service shops and schools. Its battery operation, light weight, and small size make it a truly portable instrument.

1.2 Features

* 21mm LCD display provided. MAX indication 1999.
* 9 Ranges form 200pF to 20mF.
* High accuracy in measuring.
* External knob adjustment of the zero value of the display, approx ±20pf.
* Dual – Slope integration A/D converter.
* Overload indication of "1".
* Safety designed test probe.
* Size: 31.5mm×91mm×189mm (H × W × L).
* Weight: 240g (including battery).

2. SPECIFICATIONS

Accuracy is specified for a period of one year after calibration and at 18C to 28C (64F to 82F) with relative humidity to 80%.

2.1 General

POWER SUPPLY	9V battery NEDA 1604 or 6F22 006P
LOW BATTERY INDICATION	" [battery symbol] " appears on the display
FUSE PROTECTION	100mA/250V
EXCITATION VOLTAGE	2.8V peak,MAX
OPERATING TEMPERATURE	0°C to 40°C (32°F to 104°F)
STORAGE TEMPERATURE	-10°C to 50°C (14°F to 122°F)

2.2 ELECTRICAL SPECIFICATIONS

Range	Resolution	Accuracy	Test Frequency
200pF	0.1pF	±0.5 of full scale ±1 digit	800Hz
2nF	1pF	±0.5 of full scale ±1 digit	800Hz
20nF	10pF	±0.5 of full scale ±1 digit	800Hz
200nF	100pF	±0.5 of full scale ±1 digit	800Hz
2μF	1000pF	±0.5 of full scale ±1 digit	800Hz
20μF	0.01μF	±0.5 of full scale ±1 digit	80Hz
200μF	0.1μF	±0.5 of full scale ±1 digit	8Hz
2000μF	1μF	±1.0 of full scale ±1 digit	8Hz
20mF	10μF	±2.0 of full scale ±2 digit	8Hz

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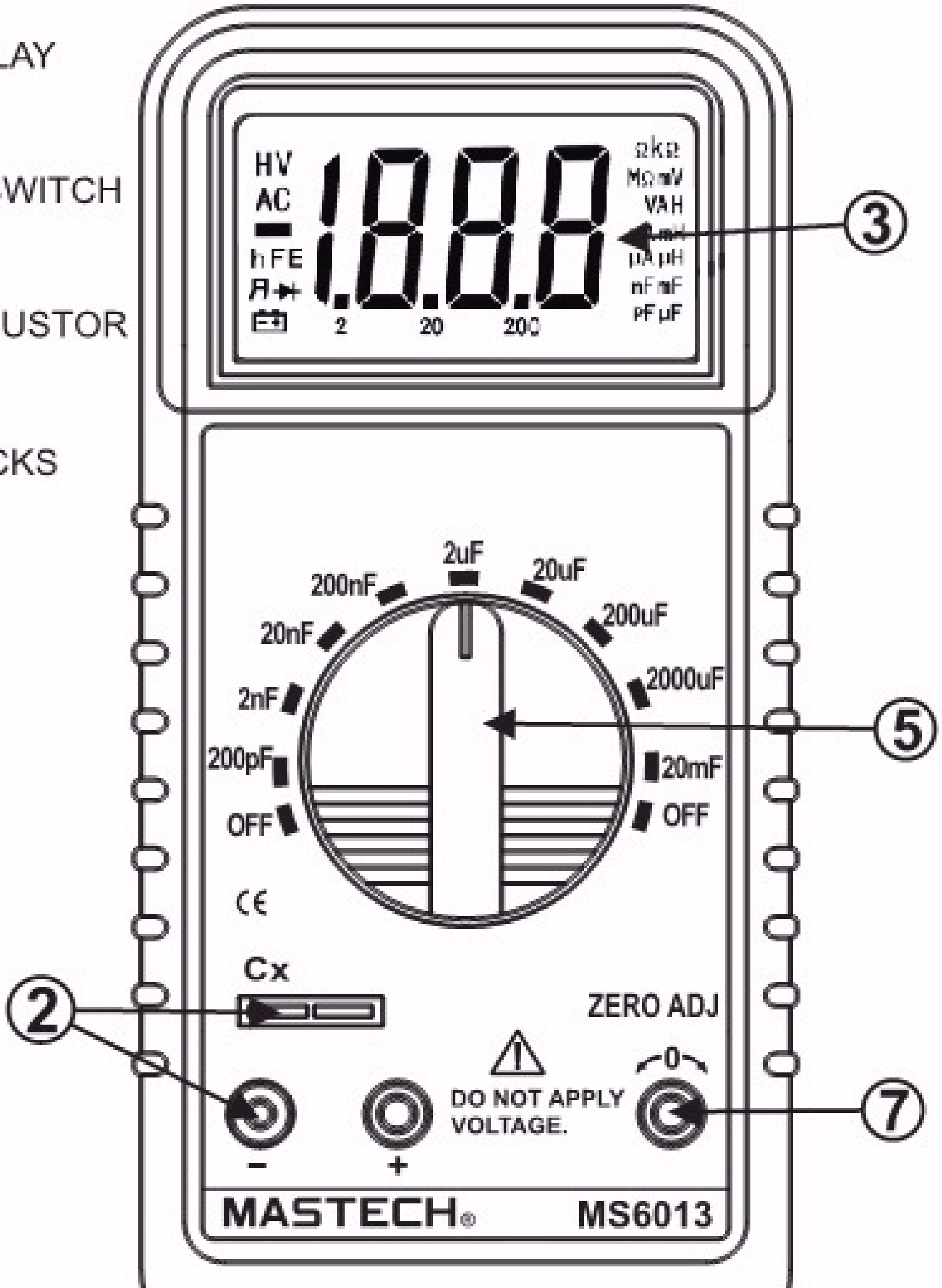
FRONT PANEL

① LCD DISPLAY

② ROTARY SWITCH

③ ZERO ADJUSTOR

④ INPUT JACKS



3. Operating Instruction

3.1 Caution Before Measurement

1. Be sure that battries are correctly placed in the battery case and connected to the battery snap.
2. Observe polarity when connecting polarized capacitors.
3. Full discharge any capacitors.
4. Never apply voltage to the test jacks, serious damage may result.
5. Do not short the test leads together. This will make extra large power consumption of the battery. It will show over - range indication on all ranges.

3.2 Consideration

1. If the capacitance value is unmarked, start with the 200pF range and keep increasing until the over - range indication goes off and a reading is obtainted.
2. A shorted capacitor will read over - range on all ranges. A capacitor with low voltage leakage will read over - range, or a much higher value than normal. An open capacitor will read zero on all ranges (possibly a few pF on the 200pF range).
3. Measure of very low capacitances should be performed using extremely short leads or the capacitor measuring socket above input jacks in order to avoid introducing any stray capacitance.

4. When using the optional test leads, remember that the leads introduce a measurable capacitance to the measurement.
   As a first approximation, the test lead capacitance may be measured by opening the leads at the tips, recording the open circuit value and subtracting that value (if the value is negative than adding) from the display results. However, in order for this correction to be valid, the succeeding capacitor measurement must be made with all other measurement conditions exactly the same.
5. Capacitors, especially electrolytics, often have notoriously wide tolerances. Do not be suprised if the measured value is greater than the value marked on the capacitor, unless it is a close tolerance type. However, values are seldom drastically below the rated value.
6. The existence of a leaky capacitance may be detected if the value changes significantly as the scales are changed. The effect of the internal leaky resistance is minimized on the lower range scales.

3.3 Capacitance Measuring Procedure

1. Select the range switch for the maximum expected capacitance.
2. Check the zero display : If your test range on 200pF, 2nF 20nF. Before connecting the capacitor under test (but after inserting any test leads or test fixtures). rotate the front - panel adjust knob for a zero display. This “ZREO ADJUSTMENT” is limited to approx. 20pF to 20pF.
3. Connect the alligator clips to capacitor leads or insert leads of the capacitor into its measuring socket.
4. Read the display. The measuring value is direct reading and the electrical unit (pF, nF, μF, mF) is indicated. If DISPLAY show “ 1 “. It indicates on Out - of Range measurement. If the display indicates one or more leading zero's shift to the next lower range scale to improve resolution of the measurement.
5. ROTARY SWITCH: Be sure to set “ OFF ” position when non using.

4. Maintenance

* When the left corner of LCD display show " [battery symbol] ". It is necessary to replace the battery. Remove screws on the back cover and open the case . Replace the exhausted battery with a new one .
* Fuse rarely need replacement and blow almost always as a result of the operator's error. Open the case as mentioned above, and then take the PCB out from the front cover. Replace the blown fuse with same ratings (200mA/250V quick acting).
* If any fanlts or abnormalities are observed , the meter can not be used any more and it has to be checked out .
* Never use the meter unless the back cover is in place and fastened fully .
* Do not use abrasives or solvents on the meter , use a damp cloth and mild detergent only .

5. Accessories

5.1 Supplied With The Capacitance Meter

Test Leads	MASTECH HYTL - 6013
Battery	9V NEDA 1604 or 6F22 006p
Operating Manual	HYS006689
Holster	HYHT - 060

5.2 HOW TO USE THE HOLSTER

The holster is used to protect the meter and to make the measurement more comfortable, It comes with two stands installed together. The figure shows how to use the holster to:

1. Support the meter with a standard angle.
2. Support the meter with a small angle using the little stand.
3. Hang the meter on the wall using the little stand. Take the little stand off from the back side of the large stand and insert it into holes located upper on the holster.